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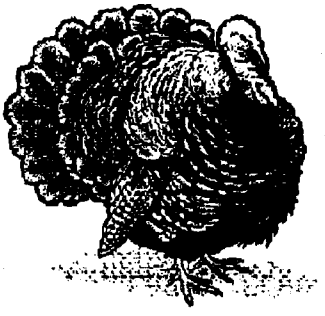
Segment 1 Performance Report
FY 1998

Project W-131-R: Population Ecology of Eastern Wild Turkeys in Illinois



Progress Report to

Illinois Department of Natural Resources

Submitted by:

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Illinois Natural History Survey
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30 June 1998

STUDY 101: HABITAT COMPARISON OF PRODUCTIVE AND UNPRODUCTIVE TURKEY MANAGEMENT AREAS

Job 101.1; Title: Selection of study areas

We selected Clark and Cass counties in Illinois to serve as the focal study areas for field research. Selection was made using habitat data, turkey harvest statistics, and observations of Illinois deer hunters. Cass and Clark counties are physiographically similar in that both are in the border area between the Grand Prairie area of central Illinois and the midwest Oak/Hickory forest (Schwegman 1973). Cover types in both counties consist of remnant wood lots interspersed with intensive row crop agriculture. Percent forest coverage is equivalent (18% total, 8% oak/hickory in Cass; 20% total, 11% oak/hickory in Clark) and forest structure is similar (11% saw timber, 3% pole timber, and 2% seedling/sapling stages in Cass; 14% saw timber, 3% pole timber, and 2% seedling/sapling stages in Clark; Iverson et al. 1989).

Despite these gross habitat similarities, turkey populations in Cass and Clark counties have performed quite differently. Cass county has had 2 releases (17 total birds, 1985 and 1996) and harvest during 1990-1996 has totaled 651 birds leading to the conclusion that Cass county has a robust turkey population. In contrast, Clark county has had 5 releases (79 total birds; 1982, 1989, 1992, 1996, and 1997) yet was able to sustain a harvest of only 85 individuals over the same period (1990 - 1996, Garver 1997). Trends in harvest are supported by observations of Illinois deer hunters. In a combined ranking of the average number of turkeys reported seen or heard by successful bow and shotgun deer hunters in 1995, Cass county ranked 18th out of the 102 counties in Illinois . By the same criteria, Clark county ranked 90th (data in Anderson et al. 1995).

Job 101.2; Title: Database assembly and identification of meaningful habitat descriptors
and
Job 101.3; Title: Comparison of landscape level habitat features and construction of a habitat suitability model for turkeys in Illinois

Our spatial data base for habitat analysis was assembled from records of turkey sighting reported by successful shotgun deer hunters in 96 Illinois counties 1993-1997. Our goal was to create a state-wide spatial database of turkey and non-turkey areas in Illinois. The spatial resolution of data reported by deer hunters is at the 1 mi^2 section level. This effort required hundreds of hours of data transcription from the county road maps used at deer check stations. Year, county, township, range, section, and number of turkeys seen were entered into a computer spreadsheet so that a digital map of turkey sightings could be created for further analysis using the INHS's GIS facilities (Figure 1.).

We identified 6815 sections statewide where turkeys have been sighted at least once in 1993-1997. However, the number of successful deer hunters per turkey reporting periods (1-5 years depending on the number of times that deer hunters were asked to report turkey sightings in a given county) ranged from 216 to 12985 in the 96 counties. This range suggests that turkey sightings are not directly comparable from one county to the next because of large differences in

observer effort. To control for observer effort we are using county-specific records of successful deer hunters to subsample the 6815 turkey sections statewide. The number of sections from each county that is used in the final analysis will be standardized by randomly choosing a number of sections that is based on a sliding function which compares the individual county's successful deer hunters to the 10th percentile of successful deer hunters for all 96 counties (1993-1997). This will produce a database that will allow county to county comparisons of habitat features (ie Clark vers Cass; figure 2, 3) as well as regional comparison (i.e. east-central versus west-central Illinois).

Selection of habitat variables awaits final construction of the statewide spatial data base. We are using an empirical approach. A broad number of potential variables describing habitat features and human influence will be measures for a matched sample of turkey and non-turkey sections. The variables will then be sorted using a principle components analysis and the variables that best describe the variation in the combined sample of turkey and non-turkey sections will be interpreted relative to turkey habitat studies in other states. The data will also be used to produce a model of turkey habitat in Illinois that can be applied by IDNR habitat managers.

Job 101.4; Title: Analysis and reporting.

The final report on Study 101 will be submitted during FY 1999 at no additional cost.

Study 102; MORTALITY OF FEMALE TURKEYS AT PRODUCTIVE AND NON-PRODUCTIVE TURKEY MANAGEMENT AREAS

Job 102.1 Study areas chosen were Clark county (non-productive) and Cass county (productive). See description under Job 101.1.

Job 102.2; Title: Capture and radio-marking of wild turkeys

Our trapping effort began on 23 December with the establishment of bait sites in Clark county. During December-March we baited at 8 sites in Clark county and 4 sites in Cass county. Bait night per site ranges from 86 (the first site baited in Clark county) to 6 (the site where turkeys were captured in Cass county). In terms of bait nights per county, our trapping effort in Clark county (238 bait nights) was over 4 times that of our effort in Cass county (57 bait nights). Unfortunately, we only observed evidence of turkey use of bait sites in Clark county once. We tried for the next 4 consecutive mornings to capture turkeys at this site but were unsuccessful. In Cass county turkeys used 3 of the 4 bait sites and on 19 January, we were able to capture 25 turkeys just west of the confluence of Panther and Cox creeks at Site M. These included 2 sub-adult males, 5 sub-adult females, and 18 adult females. All were banded with aluminum leg bands, and 18 hens (5 sub-adult and 13 adult) were fitted with backpack type radio-transmitters.

Our 1997 sample thus was 0 radioed hens in Clark county and 19 radioed hens in Cass county.

Our trapping effort this year was severely hampered by unusually mild winter weather and lack of snow cover. This coincided with a heavy oak mast crop in parts of Illinois (Clark county included) thereby giving turkeys little reason to find and use bait sites. To prepare us for next year's trapping season, we have purchased additional nets in "diamond" and "standard" configurations, and an ATV. We are hopeful that this will enable use to maintain more bait sites and be more flexible in selecting potential trap sites.

Job 102.3; Title: Monitoring radio-equipped turkeys and identification of mortality sources.

We have been monitoring the radio-equipped hens in Cass county regularly since 19 January. Early survival (19 January - 12 April) was 100%. Since 12 April there have been 5 mortalities, each coinciding with nesting behavior and each suggesting predation. The Kaplan-Meier (Pollock et al. 1989) estimate of survival since 19 January is 0.74 (SE = 0.10).

Job 102.4; Title: Estimation of nesting rates at intensive study sites.
and
Job 102.5; Title: Estimation of hen success at intensive study sites.
and
Job 102.6; Title: Estimation of poult survival.

Since 19 March we have been recording 2-4 radio-locations per week for each radio-equipped hen to estimate reproductive parameters based on hen behavior and poult counts. Since this report is being written during the nesting and poult rearing season, it is too early to provide estimated of reproductive parameters for 1998. These will be provided in subsequent reports.

Job 102.7; Title: Analysis and reporting of data.

This document and the preliminary analysis within is being submitted as the progress report for FY 1998.

Literature Cited

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Iverson, L. R., R. L. Oliver, D. P. Tucker, P. G. Risser, C. D. Burnett, and R. G. Rayburn. 1989. The forest resources of Illinois: an atlas and analysis of spatial and temporal trends. Illinois Natur. Hist. Survey Special Pub. 11. 181pp.

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Pollock, K. H., S. R. Winterstein, C. M. Buunk, and P. D. Curtis. Survival analysis in telemetry studies: the staggered entry design. J. Wildl. Manage. 53: 7-15.

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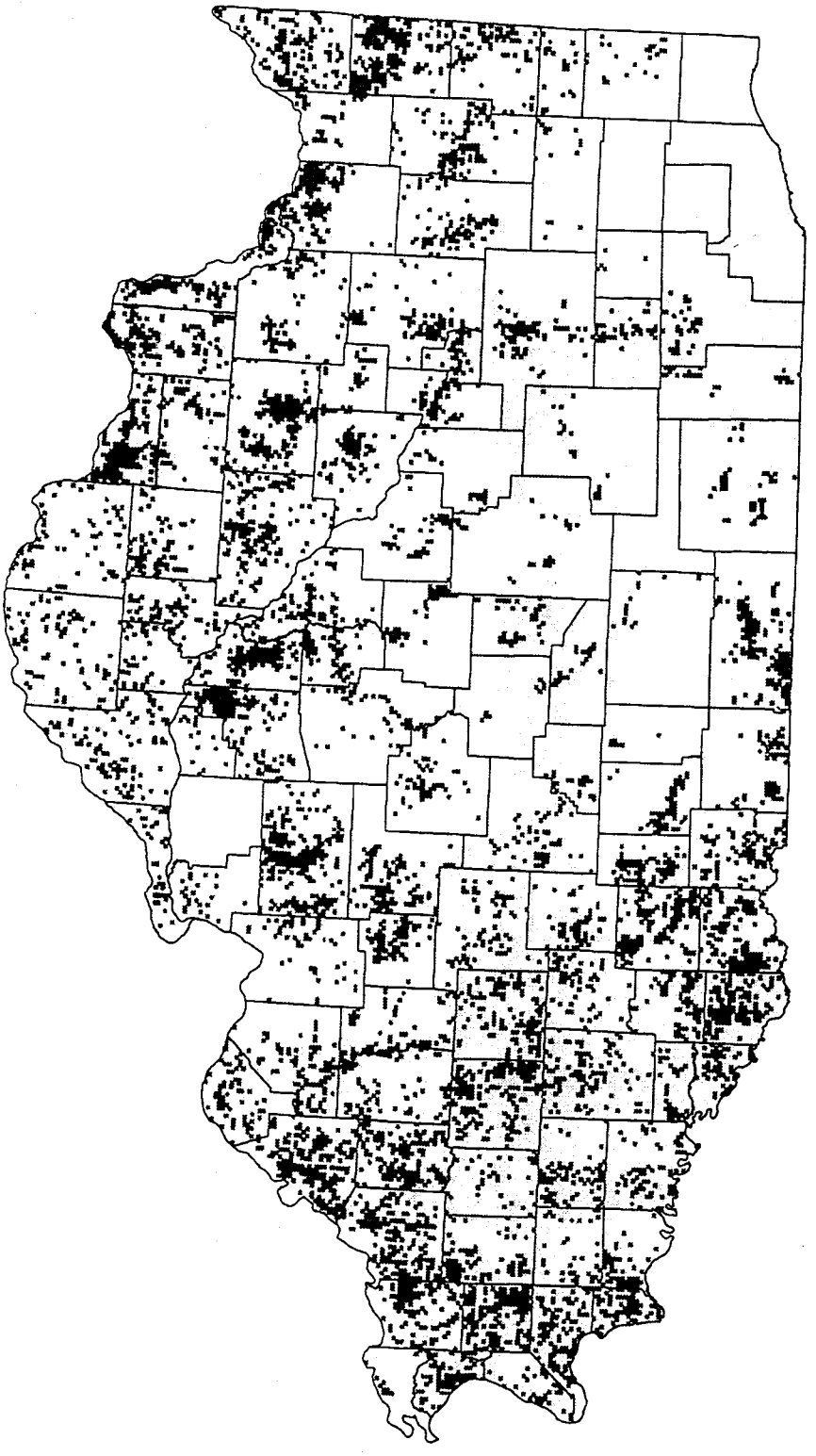
List of figures.

Figure 1.

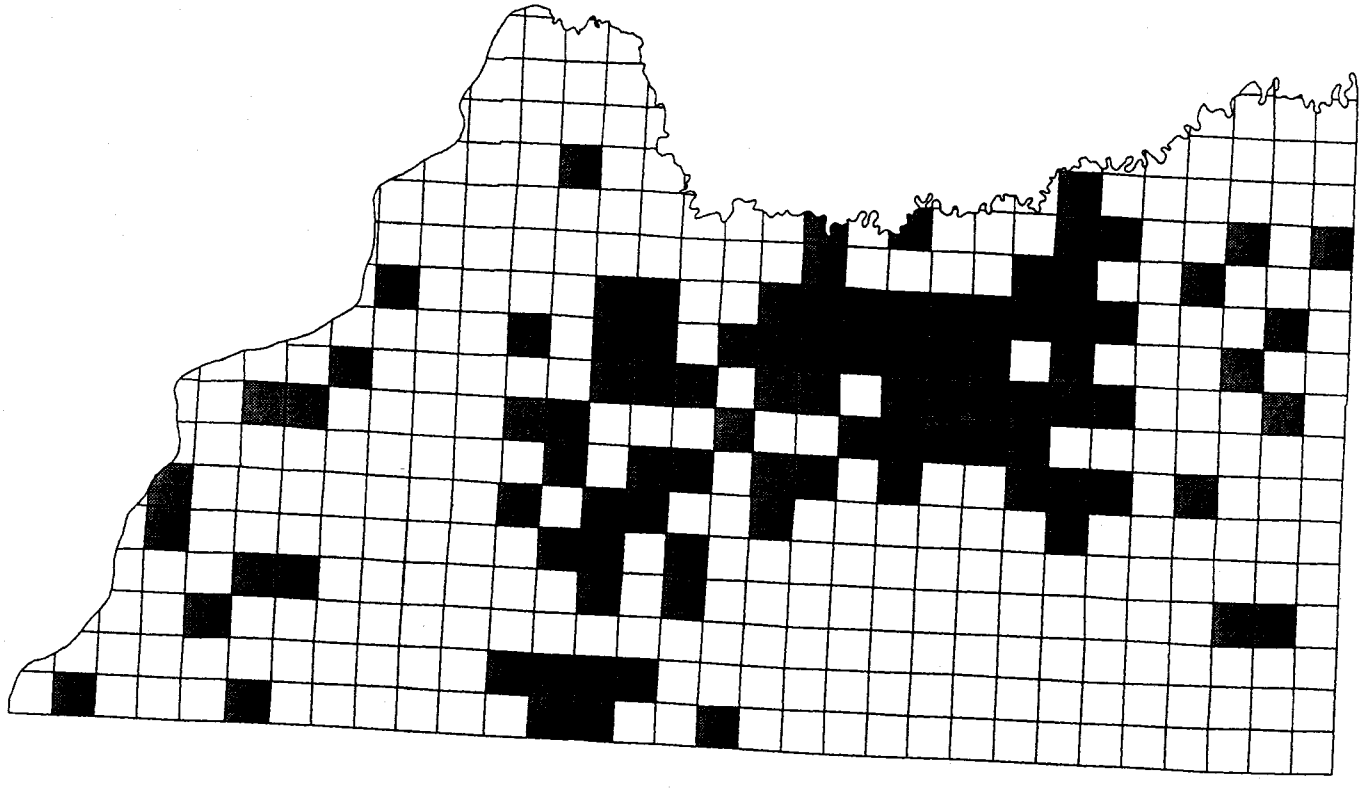


Turkeys
County

N
W E
S

Figure 2

Cass County



Cass

no turkeys

turkeys

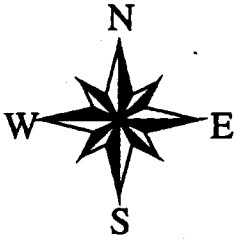
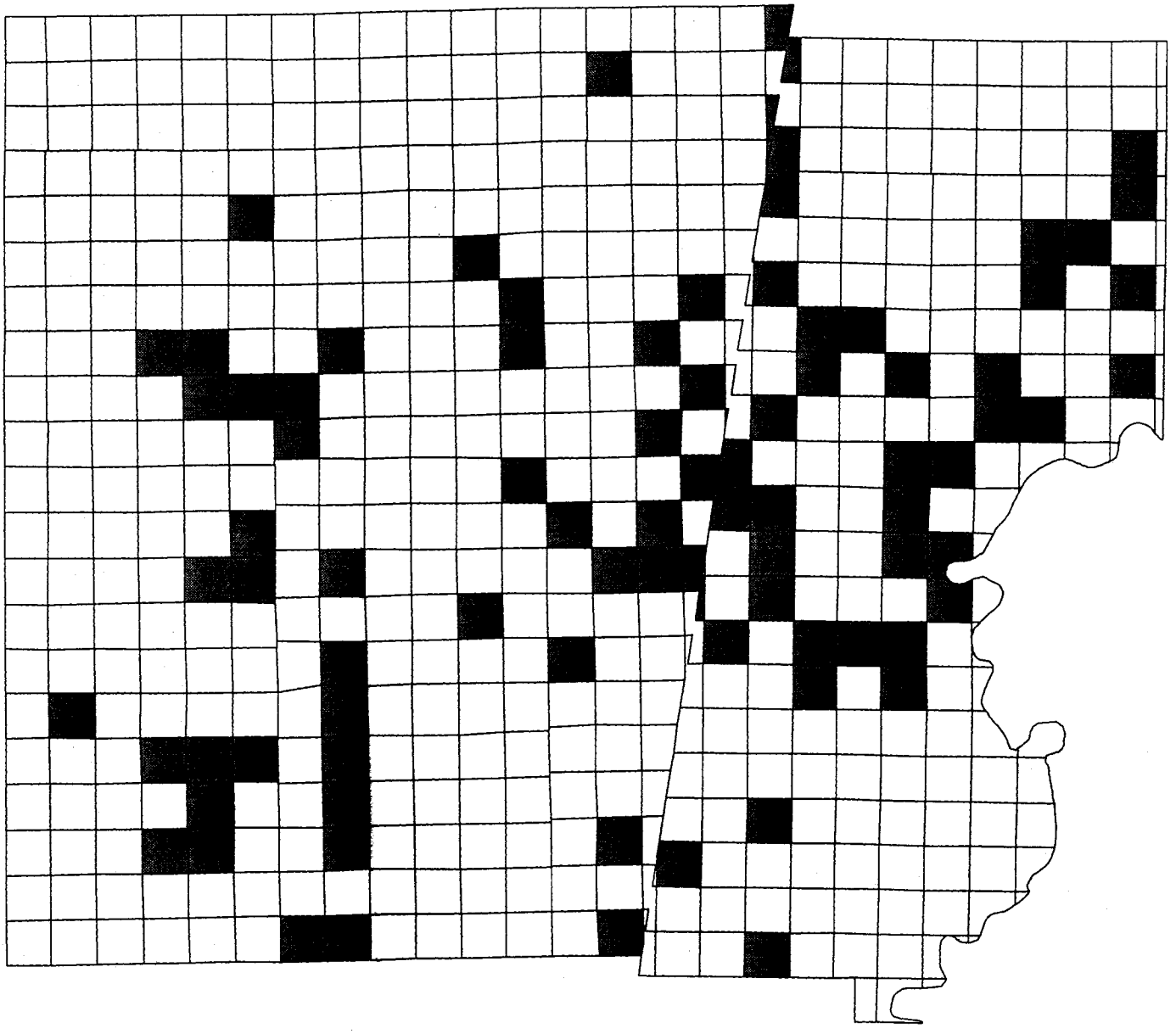
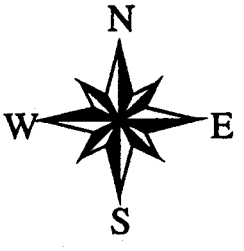


Figure 3.

Clark County





Clark

no turkeys

turkeys